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RHIC RETREAT 2000

## **Run 2001 Dry Run System Commissioning**

- **Introduction:**

- Major hurdles we passed in the previous run 2000' and what we learned from them.
- Where are the priorities?

- **Why is the DRY-RUN Important?**

- Organization and schedule

- **A Proposal for 2001 start up**

- **Summary**

# Introduction:

- **Major Mile Stones during the RUN 2000:**
  - **Few critical dates and lessons in the previous run:**
    - 04/19/2000 => Leif Ahrens - indication that the chromaticity was not what we had prepared for (LOWER injection energy - worse the magnetic field! Momentum dependence on tunes - very tight!
    - Discrepancy between the “required” and measured tunes! (Picking “better tune box”).
    - 05/02/2000 => Q89 wrong polarity, Trim quad, and correctors’ corrections.
  - **Beam Life time improvement at injection:**
    - Orbit Correction
    - Picking better tunes
    - Correcting the QUADRUPOLE POWER SUPPLIES POLARITY
    - Real CHROMATICITY correction
    - Coupling correction
  - **Lessons during the ramp attempts:**
    - Tunes are all around the place - why? TRIM QUAD, D0
    - Chromaticities
    - Orbit - RF tracking
    - Transition Crossing
    - AT THE END THE FIRST PART OF THE RAMP WAS SLOWED DOWN

## Major Goals in the START UP 2001:

- **Orbit correction, Tunes and Chromaticities are the first priority**
  - Tools to correct easily all of them need small improvements.
- **POLARITY of the quadrupole power supplies needs to be checked first. What is a plan:**
  - Easy to use TOOLS for everybody to allow systematic check of each new power supply by the beam (at injection). These tools are:
    - ORBIT DIFFERENCES - automatic comparison to the model expectations.
    - DISPERSION MEASUREMENTS
    - Comparison of the measured to predicted betatron functions (allow use of two kind of “models”)
- **Use TOOLS to check the POWER SUPPLIES and Wave Form Generators (WFG):**
  - Power Supply Differences (ps-compare)
  - PS all
  - Snap-Shot
  - Post Mortem
  - Status Manager

## Major Goals in the START UP 2001:

- **PLAN for the FIRST few WEEKS when RHIC is already cold:**
  - **POWER SUPPLIES have priority to prepare the new installed power supplies (+-150 and 300 A)**
    - 72 new +-150 A, 14 new +-300 A
    - 24 New  $\gamma$  control, stability, tracking
    - Snake Power supplies
    - New quench detection software
    - Train the DX magnets
    - Higher Ramp rate up to  $\gamma = 107.4$
  - **During the evenings 10 PM- 8 AM there will be BEAM at injection checkout: ORBIT DIFFERENCES, quad polarity, dispersion etc.**
    - After first week or two there will always be possibility of putting the beam into one ring

## **DRY RUN GOALS:**

- **Check systematically all new Power Supplies:**
- **Sequencer:**
  - **Beta squeeze**
- **Software for the POLARITY check**
- **Instrumentation:**
  - **TUNE FEEDBACK**
  - **BPM's**
- **RF**
  - Longitudinal damper tests
  - Storage Cavity conditioning
- **Abort - Permit link**
- **Injection**
  - **Injection kicker run to make sure all functionality is still there**
- **Controls**
  - **QUENCH RECOVERY**
- **Chromaticity Measurement**
- **Orbit Correction and BPM's**

## **SUMMARY:**

- **Dry Run in February will allow us to check if we are ready for the new 2001 run with software as well as with new hardware.**
- **Beam Studies at the START-UP 2001 will be concentrated on QUAD polarity check - and comparisons between: measured and model predicted optical functions.**
- **Hopefully we will not make the same mistakes twice!!**